



Biochemistry & Molecular Biology

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UNDERGRADUATE NEWSLETTER



Continuing the series of interviews with faculty in the BMB Department (previous interviews can be found at <http://www.bmb.psu.edu/undergrad/newsletter/index.html>) the **BMB Undergraduate Newsletter** is pleased to feature Dr. Wendy Hanna-Rose in this issue. Dr. Hanna-Rose's research interests are in the area of the molecular genetics of metabolism and development in the tiny nematode, *Caenorhabditis elegans*. (A detailed description of Dr. Hanna-Rose's research can be found at <http://www.bmb.psu.edu/faculty/hanna-rose/hannarose.html>)

UN: What is the immediate goal of the research being conducted in your laboratory?

H-R: In the Hanna-Rose lab, we aim to understand how genes control the formation of the animal body during development. We use a microscopic worm as our model because it can be easily manipulated. We specifically try to answer questions about how cells and tissues coordinate changes in shape and behavior to form functional organs by studying the development of reproductive organs in the worm. Currently, we study genes and their corresponding proteins that control cell shape in specific cells and genes/proteins that allow coordination of developmental events throughout the whole organism.

UN: What are the possible larger implications/applications for the findings of your research?

H-R: Human development uses genes, proteins and developmental controls that are similar or identical to the ones we study. Thus, our work has implications beyond understanding how worms develop; we can also shed light on normal human development and aberrant developmental events that lead to birth defects. Some of the proteins we study also have important roles in vitamin metabolism and organism physiology, impacting how an organism ages. Thus, we aim to also help decipher basic concepts of organism physiology and aging.

UN: Why did you choose to pursue a career in academic research and why in your particular field?

H-R: I chose a career in academic research simply because I never wanted to leave school. I have a passion for learning and See **INTERVIEW**, Page 2~

2 New Options Launched in the BMB Major

Beginning with Summer 2008, the BMB Department is offering two Options within the BMB major. The new Options are the **Biochemistry Option (BIOCH)** and the **Molecular and Cell Biology Option (M C B)**. Students who begin their undergraduate studies in 2008 will be the first to be required to designate which of the two Options they will pursue. Indeed, first-year students were asked to select their intended Option during the FTCAP process and have been given specific course check sheets outlining the requirements of their chosen Option.

The creation of the two Options recognizes the somewhat different interests of students who are drawn to the BMB major. Typically, BMB majors want to study the biochemistry of life, including the structure and function of the macromolecules that constitute living things and the flow of energy that is associated with both anabolic and catabolic processes. The alternative interest among BMB majors is in the cell itself. How does the cell control its vital processes, how does it sense and respond to its environment, how does it divide and differentiate, and how does it communicate with other cells? With a single major, students interested in either of these areas have been subjected to course requirements that are necessary See **OPTIONS**, Page 2~

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have been applying it to the field of biology since I was an undergraduate. I chose molecular genetics as my field because of some inspiring teachers. I followed my bachelors degree in biology with a Ph.D. in molecular genetics, and after postdoctoral training made my way to Penn State to continue to be involved in two pursuits I enjoy: doing molecular biology and teaching molecular biology.

UN: *What do you look for in selecting an undergraduate student to do research in your lab?*

I look for students who have demonstrated enthusiasm for pursuing scientific research by seeking out research opportunities early in their undergraduate career. I look for students who have made every effort to prepare themselves for biological research as demonstrated by a strong performance in the classroom. I am also impressed with students who can articulate their interests in research and are willing to make a significant time commitment (each semester over multiple semesters) to their research endeavors.

The **Undergraduate Newsletter** thanks Dr. Hanna-Rose for her interview.

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Course Changes Number

The next time you check your audit, you may be surprised to see a 'new' requirement that you do not recall seeing previously. What is this **BMB/Micrb 442**, you might ask? Well, if you look more closely, you will discover that BMB/Micrb 342 is no longer appearing as a requirement – unless you have already completed the course or have scheduled it for FA08. This apparent difference in the audit is due to the fact that BMB/Micrb 342 has been changed to BMB/Micrb 442. While some students take this laboratory course in their sophomore year, most students wait until their junior year and, in fact, the previous recommended schedule for all three majors in the department lists BMB/Micrb 342 in one of the semesters of the **junior** year. As the vast majority of students have not completed the prerequisites for the course until the junior year, it is completely appropriate that it be offered at the 400-level. Same course, new number!

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OPTIONS, continued from page 1

for understanding the other area. With the creation of the two Options, students can now better tailor their undergraduate program to match their interests.

What is different about the new Options? The **Biochemistry Option** is arguably the closer of the two Options to the existing BMB major. However, BMB 474, *Analytical Biochemistry* (3 cr), will be an added requirement while BMB 446, *Laboratory in Molecular Genetics II* (1 cr), will no longer be required. Also, more flexibility has been provided in what is now the List A electives in that *ANY* BMB/Chem/Micrb 400-level course may be used in this category. The physics and physical chemistry requirements of the current BMB major are retained in the new Biochemistry Option. The new **Molecular and Cell Biology Option** provides a choice in the selection of physics and physical chemistry requirements. At its heart, it requires BMB 430, *Developmental Biology* (3 cr), BMB 460, *Cell Growth and Differentiation* (3 cr), and Micrb 410, *Principles of Immunology* (3 cr) plus an additional 5-6 credits in *ANY* BMB/Micrb 400-level course. Room for an expanded list of required and/or elective courses is incorporated into the curriculum so this Option is likely to undergo further revision over time. The Department believes undergraduates in the BMB major will be more pleased with their academic program given the choice of these two Options.

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Courses Change Credit Value – Reminder

While we reported in our Spring *Newsletter* that BMB 400, *Molecular Biology of the Gene*, and BMB 401, *Introduction to Biochemistry*, would switch credit values, students who will begin this series this semester may have forgotten about this change. BMB 400, which used to be 3 credits, is now offered for 2 credits, and BMB 401, which used to be 2 credits is now being offered for 3 credits. For the BMB and Micrb majors, this means there will be no change in the *total* credits earned for the introductory series, BMB 400/401/402.

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Work Begins on North Frear Renovations

You can't miss it! Plywood walls and sealed doorways greet students who enter the lobby area between South and North Frear. At the moment, heavy equipment is also moving earth in the courtyard between North and South Frear. What's going on? North Frear is undergoing a complete renovation of its interior and a power-washing of its exterior. Plans call for all BMB instructional labs to be located on the ground floor with some sharing of labs with the Biology department. The Biotechnology instructional labs will return to the second floor roughly in the location where they were originally housed. The earth-moving work in the courtyard is in preparation for construction of a one story structure that will house a new BMB equipment laboratory. As part of that construction, the lobby area between the two Frears will be enlarged and an interior stairway from North Frear will open into the lobby. A new elevator will be installed just off the lobby in the ground entranceway to North Frear. All in all, the renovations will result in some very modern laboratory facilities both for instruction and for research. Until then...expect dust and, particularly for the Biotc and BMB lab courses, inconvenience!

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Student Clubs Want YOU!!

With the start of the new academic year, the department's student organizations also swing into action. The BMB Department supports the activities of two student clubs – the Penn State Student Chapter of the American Society for Microbiology, and the Biochemistry Society. Interested students can sign up for one or both clubs at the Involvement Fair held in the HUB from 11 a.m. to 4 p.m., August 25 & 26 or simply come to a club meeting. Clubs offer a great forum for meeting people that you tend to see in many of your classes. If you are truly interested in your field of study, you should want to promote it to the larger Penn State community in ways that are fun and, perhaps, even educational. Clubs provide an informal setting in which to ask questions that are best answered by other students and to share ideas of how the club can benefit other students, faculty, the College and University and even the community beyond the campus. A club is what you as a student make of it. Get involved!

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Take note of the 'Recession-proof' (CLS) Option

If you want a 110% chance of finding a position after completing your baccalaureate degree, go no further than the Clinical Laboratory Science Option of the Biotechnology major. If you want the satisfaction of knowing that you will use your science education every day of your working life, go no further than the Clinical Laboratory Science Option of the Biotechnology major. If you want the assurance of having a job even when the economy goes south, go no further than the Clinical Laboratory Science Option in the Biotechnology major. All this, and we have not even touched on the personal satisfaction that comes from knowing your work directly benefits other human beings. The CLS Option is one of the best kept secrets in the Eberly College of Science, but it should be to students as nectar is to a bee. If you have not settled on a major/option yet, the profession of a clinical laboratory scientist is one you may want to seriously consider. For more information, contact Dr. Mohr in 124 S. Frear.

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Attention! Students of Junior-standing in the CLS Option



A **mandatory** meeting for all students having 5th semester standing or higher in the CLS Option of the Biotechnology major will be held at 7 p.m. on September 4 in Room 101 S. Frear. Information regarding the profession of the clinical laboratory scientist, the Penn State program, the application process, the practicum, affiliated hospital schools, and career opportunities will be presented. Get all your questions answered at this meeting. If you are interested in applying for the clinical practicum but cannot attend the meeting, contact Dr. Mohr as soon as possible but not later than September 4.

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Dates to Remember

File Intent to Graduate	Aug 18 – Sept 8
Club Involvement Fair 11 am – 4 pm HUB	Aug 25 – Aug 26
Drop/Add Period	Aug 25 – Sept 3
Labor Day Holiday No Classes	Sept 1
Jr. Standing CLS Option Mtg. 7:00 pm 101 South Frear	Sept 4
Late Drop Begins	Sept 4
BMB Department Honor Students Rough Draft Due Department Office 108 Althouse by 4:00 pm	Nov 10
 Thanksgiving Holiday No Classes	Nov 24 - 28
BMB Department Honor Students FINAL Thesis Due Department Office 108 Althouse by 4:00 pm	Dec. 1
BMB Department Honor Students FINAL Thesis Due Honors College C-4 Atherton Hall by 4:00 pm	Dec. 8
Last Day Classes	Dec 12
Final Exam Week	Dec 15 – 19
 Schreyer Honors College Medal Ceremony 5:00 pm Penn Stater Conference Cen.	Dec 19
 ECOS Commencement 12:30 pm Bryce Jordan Center	Dec 20

New BMB Special Topics Course for SP09

A 1-credit special topics course (BMB 497A) will be offered next semester. The course is titled **Practical Applications of Enzymology** and will be taught by Professor Emeritus Allen Phillips. Dr. Phillips provides the following description: *The course will focus on how to understand enzymes and enzyme activity well enough to deal with their use in real-world situations. It includes the design of enzyme assays, use of coupled reactions for activity measurements, why enzymes and their kinetics appear so different from regular reaction kinetics, and how to determine kinetic constants for enzymes as well as the value of knowing them. The course will have a computer exercise that allows each student to design and perform reasonably sophisticated kinetic experiments using varied substrate concentrations and inhibitor concentrations to reveal interesting properties of an enzyme, including some mechanistic detail. The class will also have a writing exercise to help each person improve their writing skills for clear scientific communication.* The course will be offered on Tuesdays at 9:05-9:55 and has the prerequisite of BMB 401 or BMB 211 or equivalent biochemistry experience. Enrollment in the course will be limited to 15 students.

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This publication is available in alternative media on request.

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